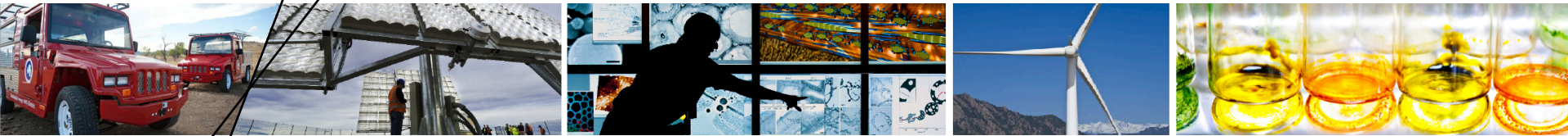


Complementary mechanisms of plant cell wall deconstruction by free and complexed enzyme systems

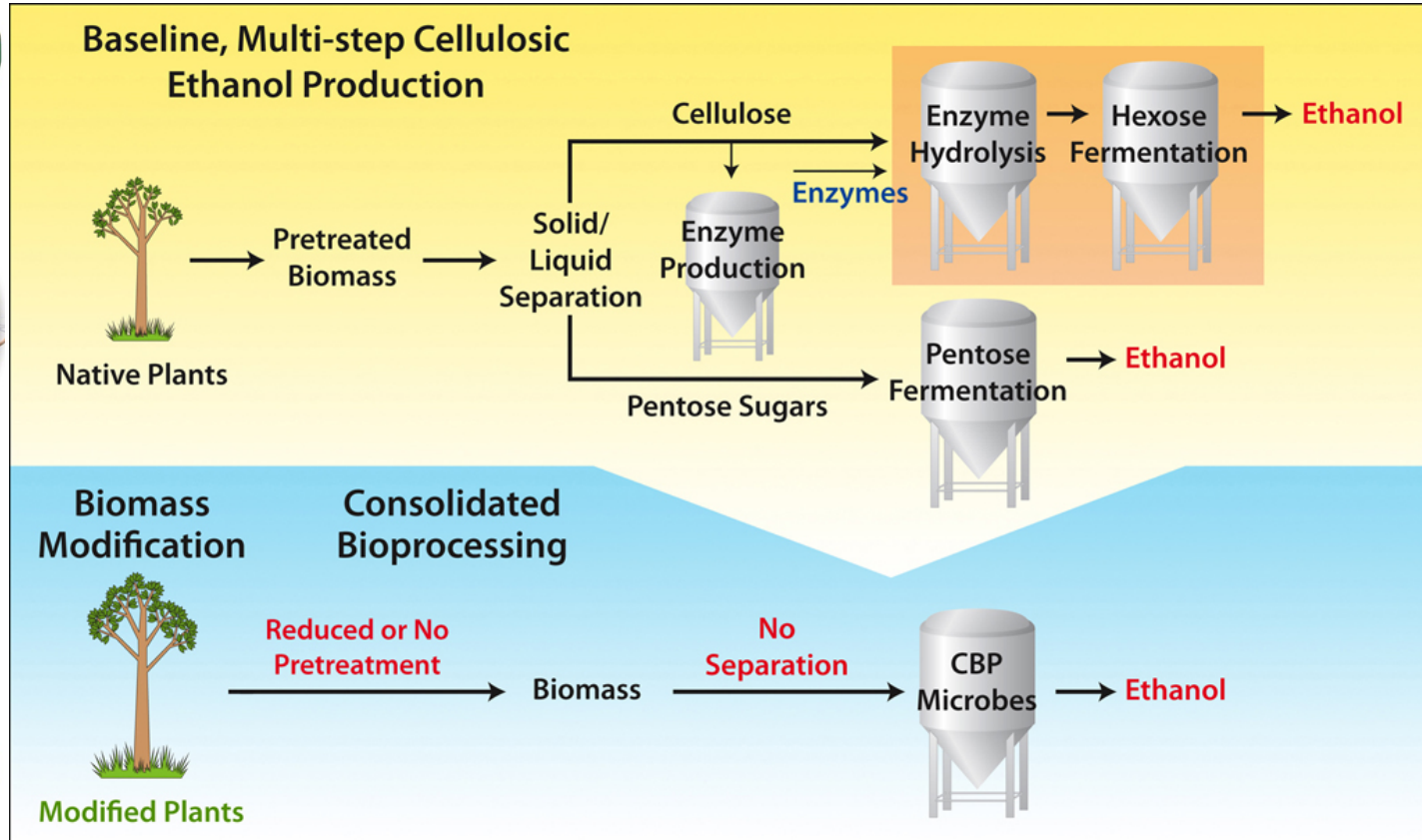
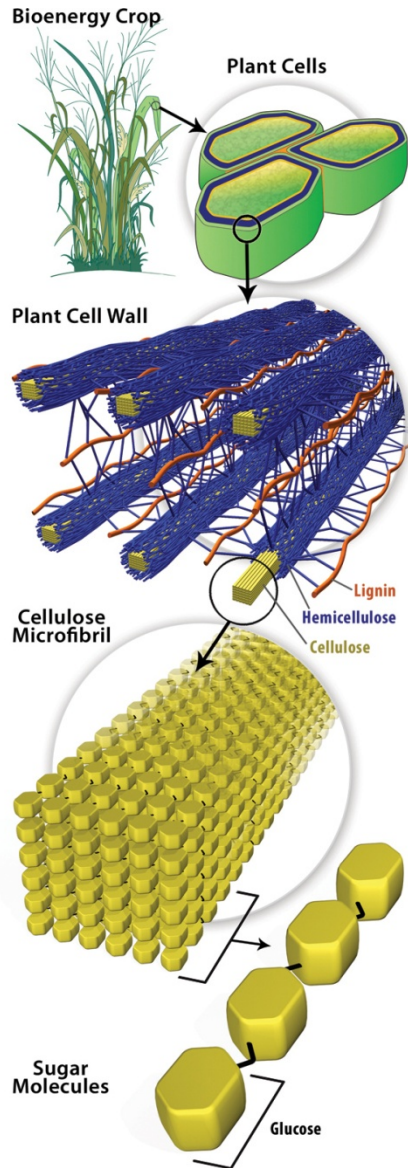


Energy Innovation Portal's Accelerating Innovation Webinar

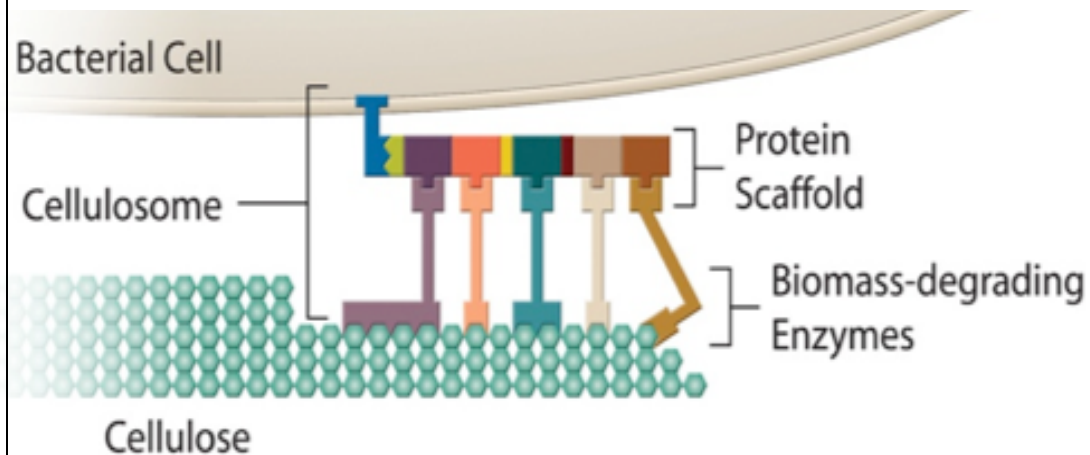
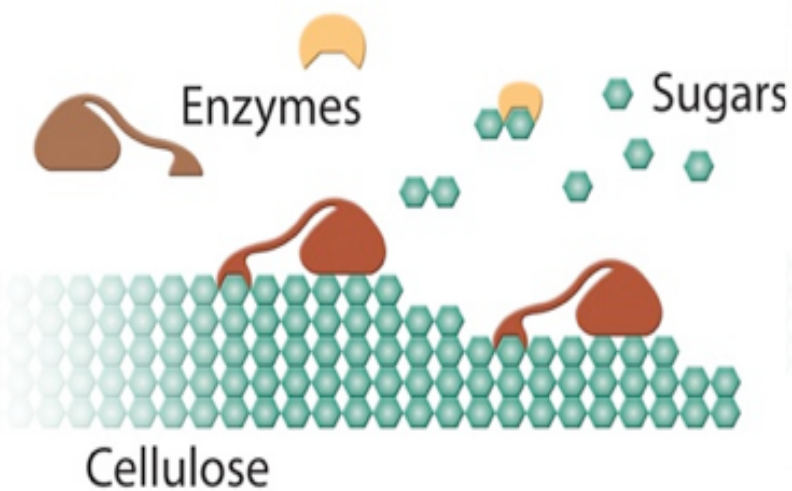
**Dr. Michael Resch
Research Scientist
Biomolecular Sciences**

8/8/2012

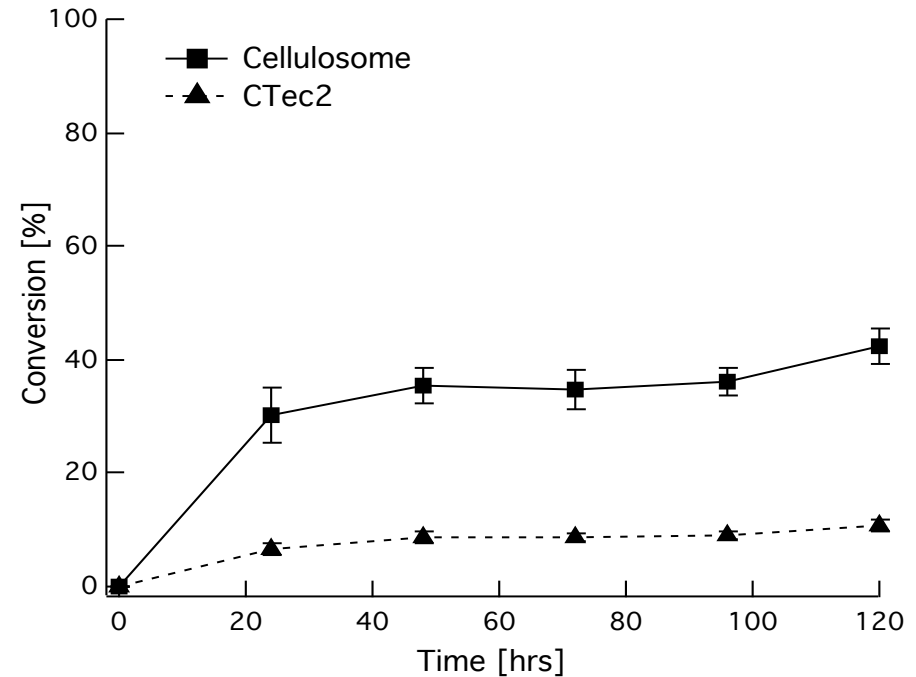
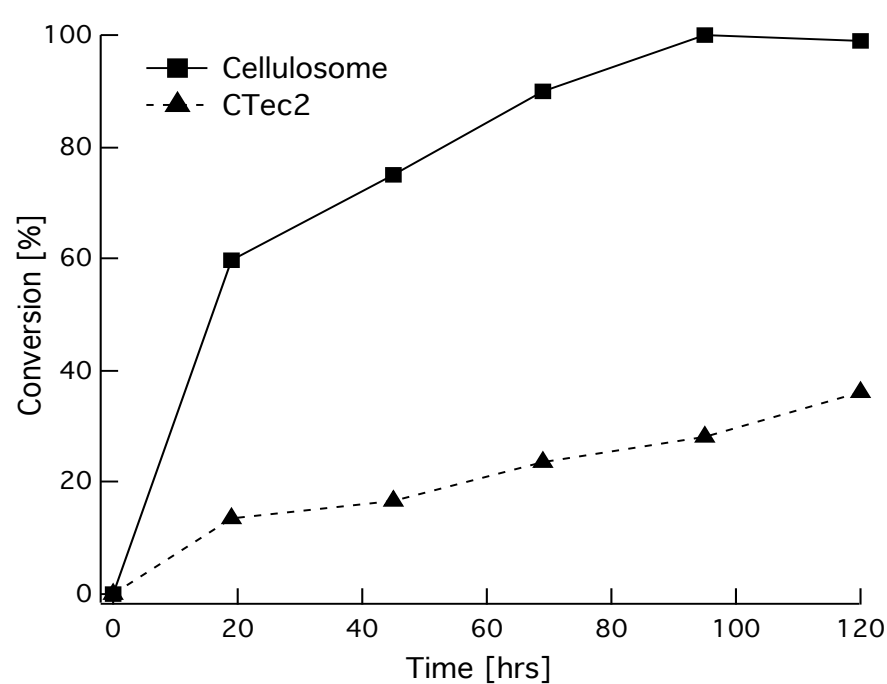
Conversion of Biomass to Fuels



Free vs. Complexed Enzymes



Cellulosomes are Better at Degrading Cellulose than CTec2



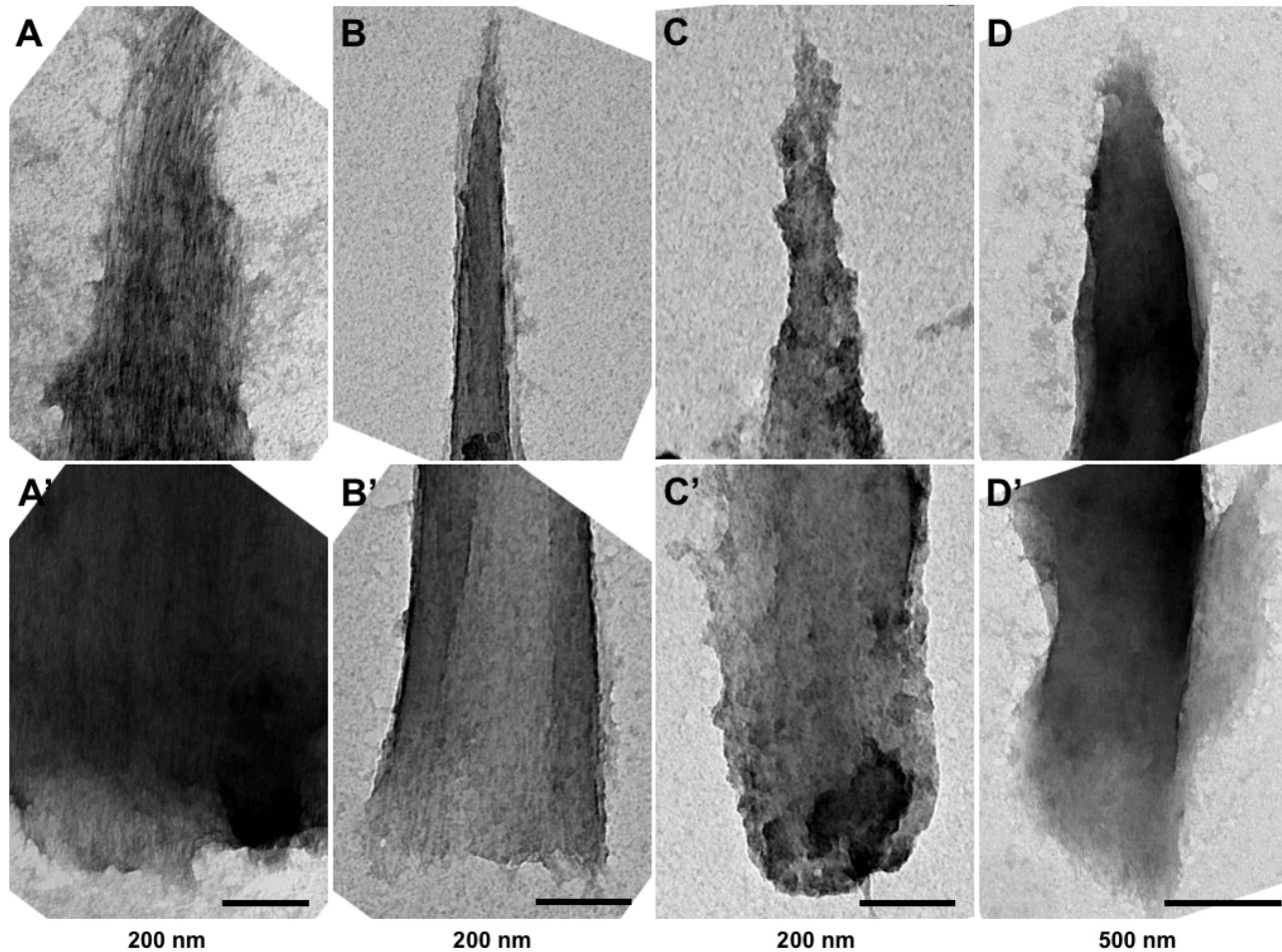
Reaction Conditions:

1% Solids, 5 mg protein / g Glucan

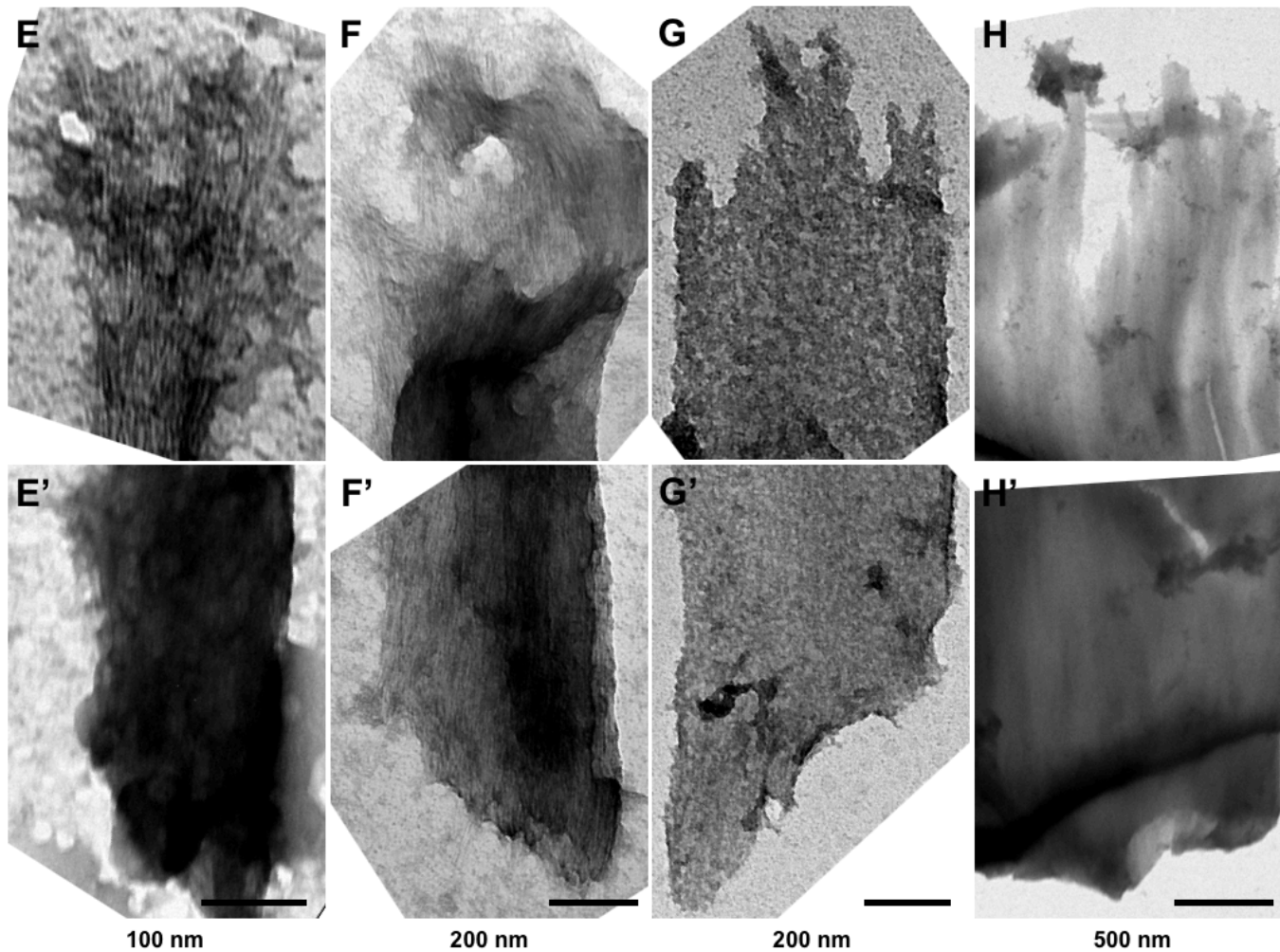
Cellulosome: 30 mM NaAc pH 5.0, 10 mM Cysteine, 2 mg/g β -glucosidase, 60° C.

CTec2: 30 mM NaAc pH 5.0, 50° C.

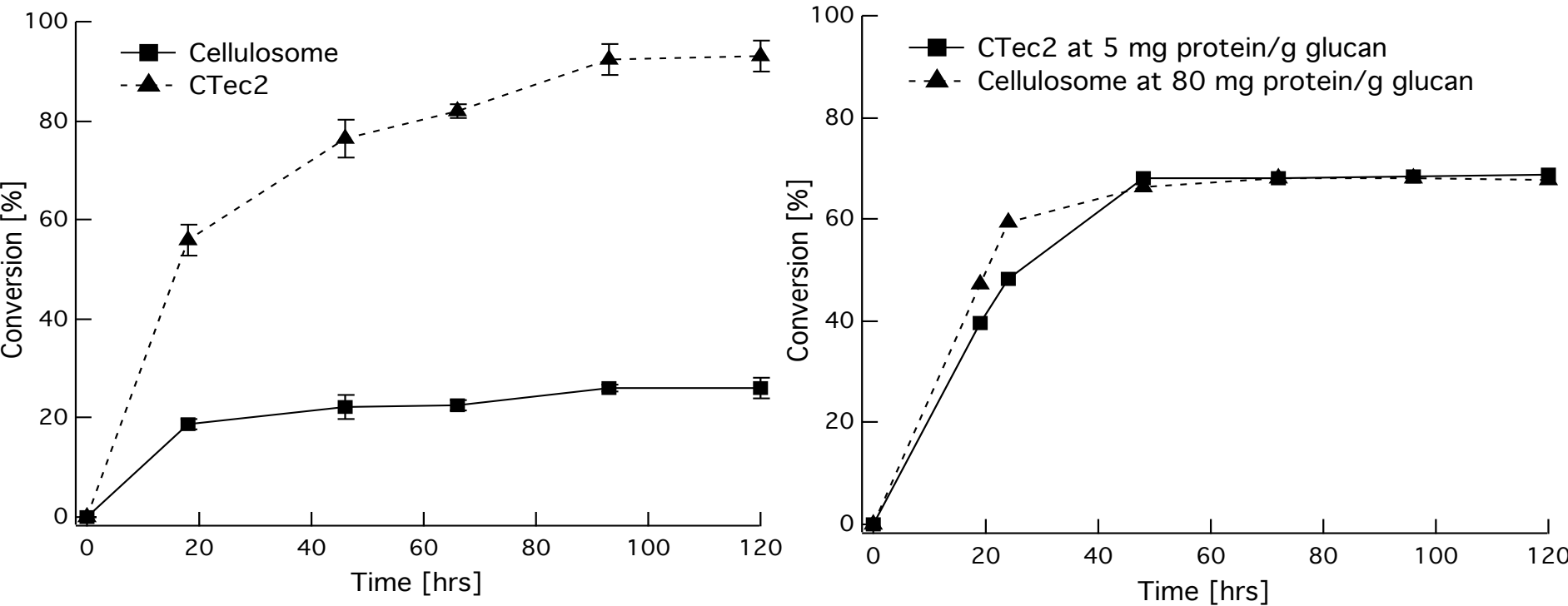
End Sharpening by CTec2



Splayed Ends by Cellulosomes

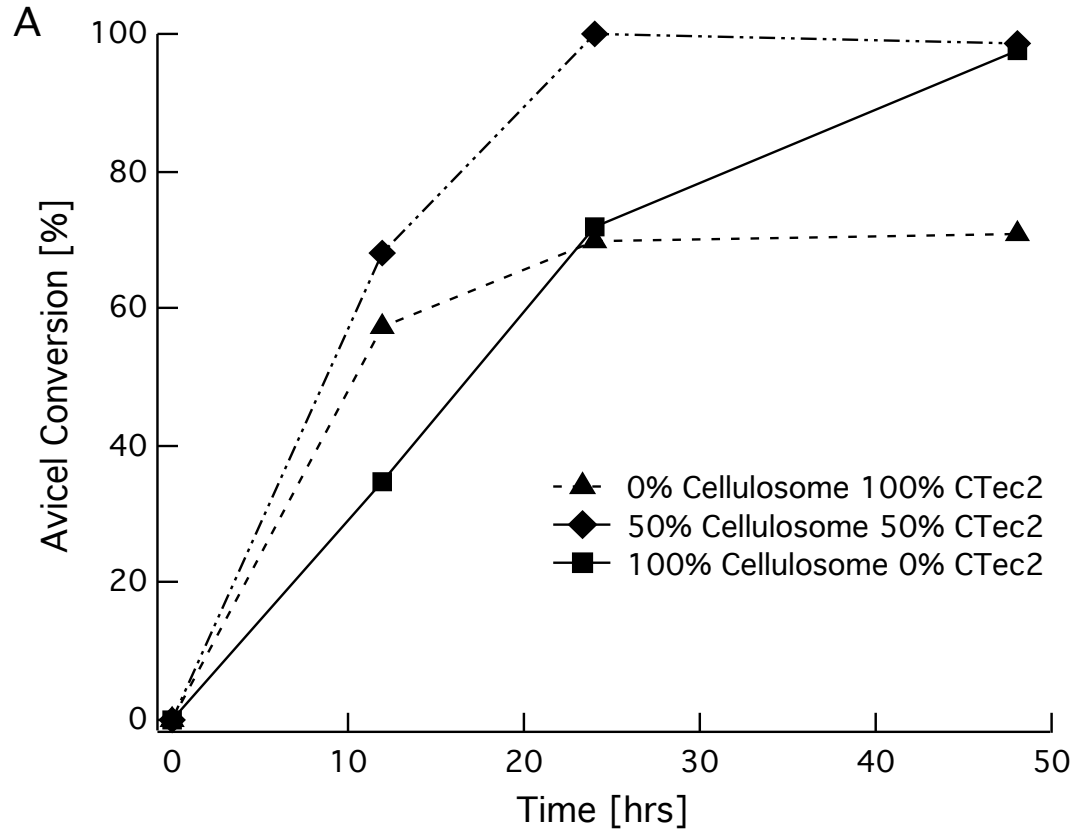


CTec2 is Better at Degrading PT Biomass



	Cellulosome	CTec2
Weight Average MW	1,000 kda	60 kDa
[enzyme] in the reaction	0.8 mg/ml	0.05 mg/ml
Approximate micromoles/L	0.8 μ M	0.8 μ M

Synergistic Enhancement of Hydrolysis



Synergistic Enhancement of Hydrolysis

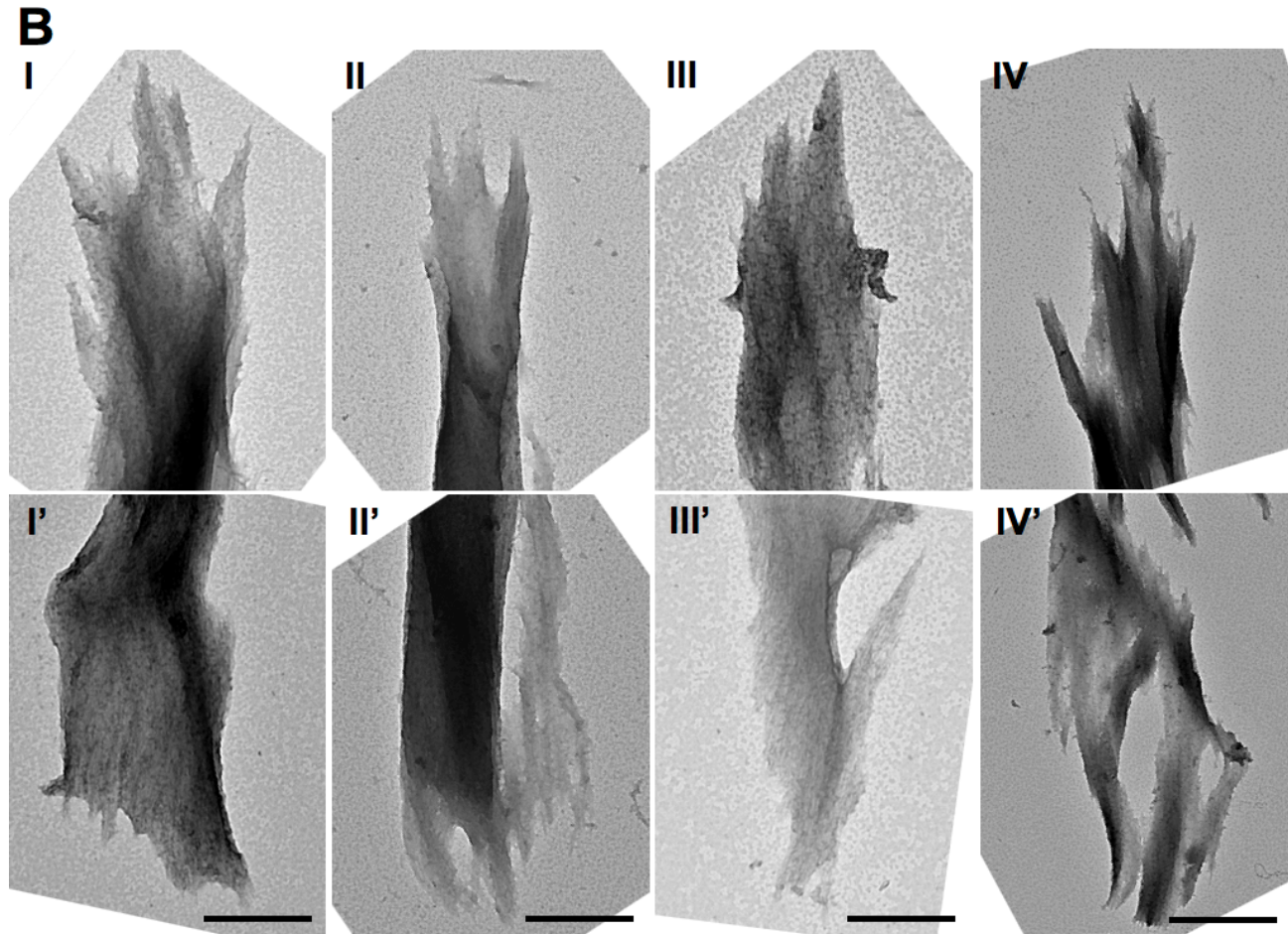
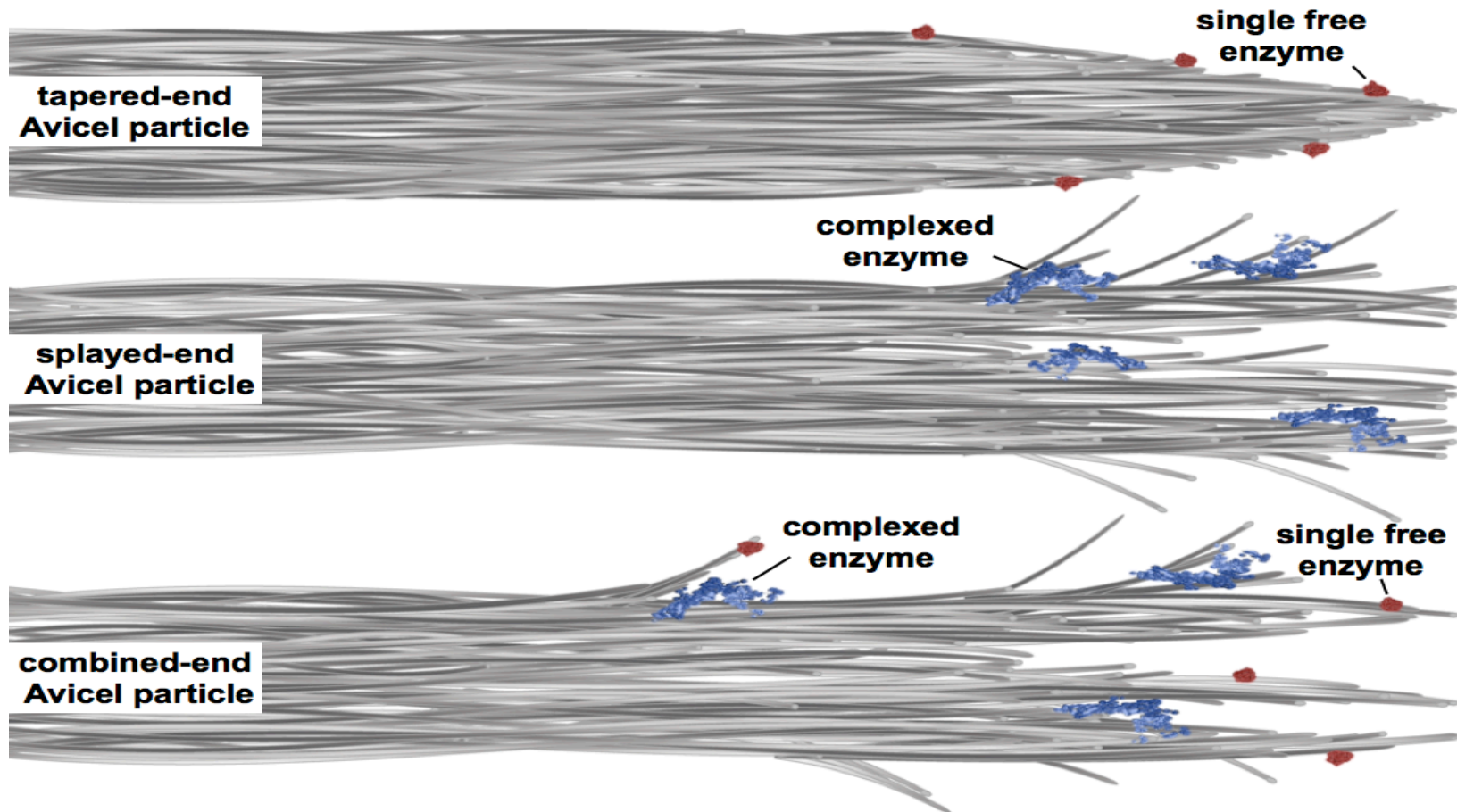


Illustration of Enzymatic Mechanisms



Acknowledgements

- **Michael Himmel**
- **Jim Brainard**
- **Gregg Beckham**
- **Steve Decker**
- **Bryon Donohoe**
- **John Baker**
- **Ed Bayer**

Research Funding

- **Office of The Biomass Program**
- **Office of Science – BioEnergy Science Center (BESC)**

